

PATENT COOPERATION TREATY

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INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/003716

International filing date (day/month/year)
09.02.2004

Priority date (day/month/year)

International Patent Classification (IPC) or both national classification and IPC
H01L51/50, G02F1/13357

Applicant
TOYOTA INDUSTRIES CORP.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:

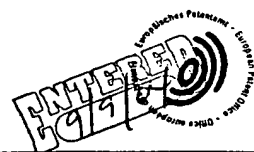


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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/003716

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/003716

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-43
	No: Claims	
Inventive step (IS)	Yes: Claims	1-43
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-43
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Cited documents

The following documents (D) are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

- D1: EP-A-1 378 787 (TOYOTA JIDOSHOKKI KK) 7 January 2004 (2004-01-07)
- D2: "ELECTRO-LUMINESCENT BACKLIGHT FOR COLOR DISPLAY" IBM TECHNICAL DISCLOSURE BULLETIN, IBM CORP. NEW YORK, US, vol. 35, no. 2, 1 July 1992 (1992-07-01), pages 433-434, XP000313346 ISSN: 0018-8689
- D3: US-B-6 420 0311 (FORREST STEPHEN R ET AL) 16 July 2002 (2002-07-16)

2. Clarity

The application does not meet the requirements of Article 6 PCT, because claims 2, 4, 9, 11, 15, 17 and 29 are not clear.

2.1 Claims 2, 4, 9, 11 and 29

The expression *in timed sequence* used in these claims relates to an operating condition of the device rather than to technical features of the device itself. It does therefore not characterise the claimed device.

2.2 Claim 15

This claim is in contradiction with the description (p.9, l.16) where it is written that the electrode contains magnesium OR a lithium silver material. On the contrary, the claims says that the electrode contains both materials.

2.3 Claim 17

The expression *S, Sm: 3A and Δ:4~30* is completely unclear and can therefore not be interpreted.

3. Novelty

The present application meets the requirements of Article 33(2) PCT relating to novelty, because the subject-matter of all claims is new.

4. Inventive Step

The present application does not meet the requirements of Article 33(2) PCT, because the subject-matter of claims 1-43 does not involve an inventive step.

4.1 Claim 1

Document D1 which is considered to represent the closest prior art discloses:

a transfective display (10) comprising a first organic light emitting device (OLED) (42,14,15) emitting light in a first bandwidth and a light modulating element (1) positioned adjacent to the emitting surface of the first OLED, wherein the OLED is fabricated on a light scattering substrate element (11) having a roughened surface.(parag. [0053]).

The device of claim 1 differs from that disclosed in D1 in that:

a second OLED being transparent and emitting in a second bandwidth different from the first and being positioned between the first OLED and the light modulating element is comprised in the device.

The technical effect arising from the addition of a second OLED in a stacked configuration is to obtain a full-coloured backlight. Therefore, the objective technical problem to be solved by the present invention is how to make from the backlight device disclosed in D1 a full-coloured backlight.

Document D2 discloses a stack of three light emitting devices, each of the devices having a different colour (e.g. red, green and blue), used as a backlight of a liquid crystal device (fig.2 and parag. 4). Both documents D1 and D2 relate to the same technical field. When trying to solve the technical problem the skilled person would look for documents dealing with backlighting devices and would find D2. The combination of both documents is therefore obvious. The advantages of using a stack of light emitting device in a backlight in order to obtain a full-coloured backlight is pointed out in D2 (parag. 2) thereby rendering the modification of the device of D1 in that of claim 1 obvious.

Claim 1 is thus not allowable under Article 52(1) EPC for lack of inventive step of its subject-matter.

4.2 Claim 8

The OLED disclosed in D1 has a first reflective conductive layer (42), a first organic emitting layer (14) and a second transmissive conductive layer (15). Document D3 discloses transparent OLED devices (fig. 2A) being used in stacked OLED devices (col.1, l.46-52 and col.10, l.33-46) wherein each OLED has two highly transparent electrodes which are only used for one OLED (col.16, l.21-35).

Trying to solve the same technical problem as above, the skilled person would use the device of D3 to add a second colour to the backlighting device of D1. The subject-matter of this claim is therefore also not inventive.

4.3 Claim 19

As already mentioned above, the backlighting device disclosed in D1 (fig. 6) has all the technical features of this claim except that it has only two electrodes. When solving the same technical problem as in 4.1, the skilled person would use the teaching of D2 in the device of D1 and reach the subject-matter of this claim, which therefore also lacks inventive step.

4.4 Claim 35

As already mentioned above, the stacked device disclosed in D2 has four electrodes, one of which is reflective, three of which are transparent. Therefore only one electrode has a significant reflectivity. Hence, the combination of D1 and D2 as described in 4.1 would also lead to the subject-matter of this claim.

4.5 Claims 3, 6, 14, 16, 18 and 20-22

D1 (fig.6) further discloses the additional features of these claims. Their subject-matter therefore also lacks inventive step.

4.6 Claims 2-4, 23-30 and 36-40

D2 further discloses the additional technical features of these claims which further characterise the coloured light emitting device stack. By solving the above mentioned technical problem, the skilled person would therefore also include these technical features to the device of D1. The subject-matter of these claims thus also lacks inventive step.

4.7 Claims 9-12 and 15

D3 (col.1, l.46 - col.2, l.16) further discloses OLED stacks with three devices

having three colours red, green and blue which may be independently addressed. A transparent electrode containing Magnesium used for an OLED is also disclosed (col.1, l.58-67) in this document. Claims 9-12 and 15 therefore also lack inventive step.

4.8 Claims 5, 7, 13, 31-34 and 41-43

The use of encapsulant, hermetically sealed packages and thicknesses of the backlight stack smaller than 2 mm are standard in the art. Furthermore, adding further substrates to the layer stack does also not lead to an inventive subject-matter.